

The Claims

1. (Currently Amended) A method ~~for computer cluster virtualization comprises:~~ comprising:

selecting a distributed application;

retrieving a policy associated with the distributed application;

dynamically selecting one of a plurality of nodes;

resetting a boot image of the selected node ~~based, at least in part, on~~ based at least in part ~~on~~ the retrieved policy, the boot image being compatible with the distributed application; and

associating a virtual disk image with the selected node ~~based, at least in part, on~~ based at least in part on the retrieved policy; and

executing at least a portion of the distributed application on the ~~reset~~ selected node, ~~as~~ reset, using the associated virtual disk image associated with the selected node.

2. (Currently Amended) The method of Claim 1, ~~wherein: the application executing on a subset of the plurality of nodes and the method further comprising:~~

the distributed application is operable to execute at a subset of the plurality of nodes; and
the method further comprises:

comparing the subset of nodes with the retrieved policy; and

selecting one of a plurality of compatible boot images based on the comparison.

3. (Original) The method of Claim 2, wherein comparing the subset of nodes with the retrieved policy comprises:

determining a count of nodes in the subset; and

selecting the boot image based on a link in the policy and the count of nodes.

4. (Currently Amended) The method of Claim 2, ~~wherein each of the subset of nodes associated with node in the subset corresponds to~~ one of the plurality of compatible boot images.

5. (Currently Amended) The method of Claim 1, wherein dynamically selecting one of the plurality of nodes comprises:

determining if one or more of the plurality of nodes is unutilized by ~~a second~~ another distributed application; and

in response to at least one of the nodes being unutilized, selecting one of the unutilized nodes.

6. (Currently Amended) The method of Claim 5, further comprising, in response to none of the nodes being unutilized, ~~further comprising~~ selecting one of the nodes utilized by the ~~second~~ other distributed application based on one or more of the following:

the retrieved policy;

low utilization of the selected node;

priority of the selected distributed application; ~~and or~~

compatibility of the selected node with the selected distributed application.

7. (Original) The method of Claim 6, wherein resetting the boot image of the selected node comprises:

automatically shutting down the selected node;

resetting the boot image of the selected node; and

restarting the selected node using the reset boot image.

8. (Currently Amended) The method of Claim 7, further comprising terminating any processes associated with the second distributed application prior to shutting down the selected node.

9. (Currently Amended) The method of Claim 1, wherein the policy ~~comprising~~ comprises a plurality of links to boot images, each link ~~associated with~~ corresponding to one of a count of nodes compatible with the distributed application.

10. (Currently Amended) The method of Claim 1, wherein the policy ~~comprising~~ comprises one or more parameters for determining ~~the~~ timing of the selection of the node.

11. (Currently Amended) The method of Claim 1, wherein the boot image ~~comprising~~ comprises a remote boot image stored in a Storage Area Network (SAN).

12. (Currently Amended) The method of Claim 1, wherein the selected node ~~associated with~~ corresponds to a first boot image prior to the reset and ~~associated with~~ a second boot image from the reset, the first and second boot images~~s~~ differing ~~in at least one~~ from each other with respect to one or more of the following characteristics:

operating system;
system configuration; and or
distributed application parameters.

13. (Currently Amended) The method of Claim 1, ~~further comprising:~~ wherein: ~~the method further comprises~~ determining that one of the plurality of nodes has failed, the failed node having executed executing at least a portion of the selected distributed application; and

~~wherein~~ selecting one of the plurality of nodes comprises selecting one of the remaining nodes in response to the failure.

14. (Currently Amended) The method of Claim 1, wherein each of the plurality of nodes ~~comprising~~ comprises ~~the~~ a same processor architecture.

15. (Original) The method of Claim 1, wherein selecting one of the plurality of nodes comprises selecting one of the plurality of nodes at a predetermined time.

16. (Currently Amended) ~~Software for computer cluster virtualization operable to:~~ One or more computer-readable tangible media embodying software, the software being operable, when executed collectively by one or more computer systems, to:

select a distributed application;
retrieve a policy associated with the distributed application;
dynamically select one of a plurality of nodes;
reset a boot image of the selected node ~~based, at least in part, on~~ based at least in part on the retrieved policy, the boot image being compatible with the distributed application; ~~and~~
associate a virtual disk image with the selected node ~~based, at least in part, on~~ based at least in part on the retrieved policy; and
execute at least a portion of the distributed application on the ~~reset~~ selected node, ~~as reset,~~ using the ~~associated~~ virtual disk image associated with the selected node.

17. (Currently Amended) The ~~software computer-readable tangible media~~ of Claim 16, ~~the application executing on a subset of the plurality of nodes and the software further operable to:~~ wherein the software is further operable, when a subset of the plurality of nodes is executing the distributed application, to:

compare the subset of nodes with the retrieved policy; and
select one of a plurality of compatible boot images based on the comparison.

18. (Currently Amended) The ~~software computer-readable tangible media~~ of Claim 17, wherein, ~~the software operable~~ to compare the subset of nodes with the retrieved policy, ~~comprises the software is~~ operable to:

determine a count of nodes in the subset; and
select the boot image based on a link in the policy and the count of nodes.

19. (Currently Amended) The ~~software computer-readable tangible media~~ of Claim 17, ~~wherein each of the subset of nodes associated with node in the subset corresponds to one of~~ the plurality of compatible boot images.

20. (Currently Amended) The ~~software computer-readable tangible media~~ of Claim 16, wherein, ~~the software operable~~ to dynamically select one of the plurality of nodes, ~~comprises the software is~~ operable to:

determine if one or more of the plurality of nodes is unutilized by ~~a second~~ another distributed application; and

in response to at least one of the nodes being unutilized, select one of the unutilized nodes.

21. (Currently Amended) The ~~software~~ computer-readable tangible media of Claim 20, wherein, in response to none of the nodes being unutilized, the software is further operable to select one of the nodes utilized by the second distributed application based on one or more of the following:

the retrieved policy;

low utilization of the selected node;

priority of the selected distributed application; ~~and or~~

compatibility of the selected node with the selected distributed application.

22. (Currently Amended) The ~~software~~ computer-readable tangible media of Claim 21, wherein, the software operable to reset the boot image of the selected node, ~~comprises the~~ software is operable to:

automatically shut down the selected node;

reset the boot image of the selected node; and

restart the selected node using the reset boot image.

23. (Currently Amended) The ~~software~~ computer-readable tangible media of Claim 22, wherein the software is further operable to terminate any processes associated with the ~~second~~ other distributed application prior to shutting down the selected node.

24. (Currently Amended) The ~~software~~ computer-readable tangible media of Claim 16, wherein the policy ~~comprising~~ comprises a plurality of links to boot images, each link ~~associated with~~ corresponding to one of a count of nodes compatible with the distributed application.

25. (Currently Amended) The ~~software~~ computer-readable tangible media of Claim 16, wherein the policy ~~comprising~~ comprises one or more parameters for determining ~~the~~ timing of the selection of the node.

26. (Currently Amended) The ~~software~~ computer-readable tangible media of Claim 16, wherein the boot image ~~comprising~~ comprises a remote boot image stored in a Storage Area Network (SAN).

27. (Currently Amended) The ~~software~~ computer-readable tangible media of Claim 16, wherein the selected node ~~associated with~~ corresponds to a first boot image prior to the reset and ~~associated with~~ a second boot image from the reset, the first and second boot image differing from each other with respect to one or more ~~in at least one~~ of the following characteristics:

operating system;
system configuration; ~~and~~ or
distributed application parameters.

28. (Currently Amended) The ~~software~~ computer-readable tangible media of Claim 16, wherein: ~~further operable to~~:

~~the software is further operable to~~ determine that one of the plurality of nodes ~~has~~ failed, the failed node ~~having executed~~ executing at least a portion of the selected distributed application; and

~~wherein the software operable to~~ select one of the plurality of nodes, ~~comprises the~~ software ~~is~~ operable to select one of the remaining nodes in response to the failure.

29. (Currently Amended) The ~~software~~ computer-readable tangible media of Claim 16, wherein each of the plurality of nodes comprising ~~the~~ a same processor architecture.

30. (Currently Amended) The ~~software~~ computer-readable tangible media of Claim 16, wherein, ~~the software operable to~~ select one of the plurality of nodes, ~~comprises the~~ software is operable to select one of the plurality of nodes at a predetermined time.

31. (Currently Amended) A system ~~for computer cluster virtualization~~ comprises:
comprising:

a plurality of computing nodes; and

a management node operable to:

select a distributed application;

retrieve a policy associated with the distributed application;

dynamically select one of a plurality of nodes;

reset a boot image of the selected node ~~based, at least in part, on~~ based at least in part on the retrieved policy, the boot image being compatible with the distributed application; and

associate a virtual disk image with the selected node ~~based, at least in part, on~~ based at least in part on the retrieved policy; and

execute at least a portion of the distributed application on the ~~reset selected~~ node, as reset, using the ~~associated~~ virtual disk image associated with the selected node.

32. (Currently Amended) The system of Claim 31, ~~wherein: the application executing on a subset of the plurality of nodes and the management node further operable to:~~

the distributed application is operable to execute at a subset of plurality of nodes; and
the management node is further operable to:

compare the subset of nodes with the retrieved policy; and

select one of a plurality of compatible boot images based on the comparison.

33. (Currently Amended) The system of Claim 32, wherein, ~~the management node operable to compare the subset of nodes with the retrieved policy, comprises~~ the management node is operable to:

determine a count of nodes in the subset; and

select the boot image based on a link in the policy and the count of nodes.

34. (Currently Amended) The system of Claim 32, wherein each of the subset of nodes associated with node in the subset corresponds to one of the plurality of compatible boot images.

35. (Currently Amended) The system of Claim 31, wherein, ~~the management node operable~~ to dynamically select one of the plurality of nodes, ~~comprises~~ the management node is operable to:

determine if one or more of the plurality of nodes is unutilized by ~~a second another~~ distributed application; and

in response to at least one of the nodes being unutilized, select one of the unutilized nodes.

36. (Currently Amended) The system of Claim 35, wherein, in response to none of the nodes being unutilized, ~~the management node is operable to select~~ ~~selecting~~ one of the nodes utilized by the ~~second other~~ distributed application based on one or more of the following:

the retrieved policy;

low utilization of the selected node;

priority of the selected distributed application; ~~and or~~

compatibility of the selected node with the selected distributed application.

37. (Currently Amended) The system of Claim 36, wherein, ~~the management node operable~~ to reset the boot image of the selected node, ~~comprises~~ the management node is operable to:

automatically shut down the selected node;

reset the boot image of the selected node; and

restart the selected node using the reset boot image.

38. (Currently Amended) The system of Claim 37, wherein the management node is further operable to terminate any processes associated with the second distributed application prior to shutting down the node.

39. (Currently Amended) The system of Claim 31, wherein the policy comprises ~~comprising~~ a plurality of links to boot images, each link ~~associated with~~ corresponding to one of a count of nodes compatible with the distributed application.

40. (Currently Amended) The system of Claim 31, wherein the policy comprises ~~comprising~~ one or more parameters for determining ~~the~~ timing of the selection of the node.

41. (Currently Amended) The system of Claim 31, wherein the boot image comprises ~~comprising~~ a remote boot image stored in a Storage Area Network (SAN).

42. (Currently Amended) The system of Claim 31, wherein the selected node ~~associated with~~ corresponds to a first boot image prior to the reset and ~~associated with~~ a second boot image from the reset, the first and second boot images differing from each other with respect to one or more ~~in at least one~~ of the following characteristics:

operating system;
system configuration; and or
distributed application parameters.

43. (Currently Amended) The system of Claim 31, wherein: ~~the management node further operable to:~~

the management node is further operable to determine that one of the plurality of nodes has failed, the failed node having executing at least a portion of the selected distributed application; and

~~wherein the management node operable to select one of the plurality of nodes, comprises the management node is operable to select one of the remaining nodes in response to the failure.~~

44. (Currently Amended) The system of Claim 31, wherein each of the plurality of nodes ~~comprising~~ comprises ~~the~~ a same processor architecture.

45. (Currently Amended) The system of Claim 31, wherein, ~~the management node~~
~~operable~~ to select one of the plurality of nodes, ~~comprises~~ the management node is operable to
select one of the plurality of nodes at a predetermined time.